CHASSIS PLANS®
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# CCXR-17 SlideWays

## Rugged Military Grade
## 1U Rack Mount – Side Access
## LCD Keyboard Console w/ KVM

## 17” SXGA LCD

## Technical Reference

Revision A
5/9/14
22009900_REV-A

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Serial number from the label on the back of the display
Description of the failure

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# Chapter 1 - Introduction

## *Description*

The CCXR-17 is a military grade high performance 1U clamshell LCD keyboard drawer offering 17-inch TFT LCD displays and sealed NEMA-4 keyboards. Unique is the side orientation allowing use in extremely tight quarters. The display can be pulled out as little as 20-inches allowing full unrestricted use in a corridor or passage that narrow such as found in an equipment or radio van mounted on a Humvee. There is no other display with keyboard offering that compact footprint.

The CCX family is designed to meet Mil-Std 901D and 810F and includes a solid milled aluminum front panel, lightweight 5052-H32 aluminum construction and locking stainless hardware throughout. The drawer is held closed by two captive thumb screws. Friction slides are included standard. Friction slides assure the drawer stays where you put it and doesn't randomly slide in and out of the rack in the back of a moving vehicle. The CCXR-17 is ideal for mounting in a transit case or moving vehicle for adverse environments that would destroy lesser displays.

The 17-inch display offers 1280 x 1024 native resolution, 380nit brightness, 1000:1 native contrast, and 80 degree viewing angle.

The display is provided with 1.1mm soda lime glass with an ITO conductive EMI filter and an additional 1.1mm soda lime glass overlay with sputtered anti-reflective (AR) coating. Both pieces of glass are optically bonded to each other and to the front of the display for superior viewing and ruggedness. A 3mm copper bus bar around the entire glass stack-up provides grounding. The contrast is enhanced to approximately 1300:1 with this ITO/Anti-Reflective glass stack-up.

The Aspect Ratio for the display is 5:4. The Pixel Pitch for the 17-inch display is .264 x .264mm. The display offers 16.7 million colors (True Color). The display provides multiple signal input options including aRGB and DVI-D.

The display offers a high quality advanced scaling controller with a Genesis chipset. The LCD controller offers DVI-D and VGA (aRGB) inputs. This is a specifically ruggedized controller offering as standard conformal coating with high shock/vibration and temperature extreme tolerances.

With only 24.6-inches of installed depth, the CCXR-17 is perfect for confined rack or transit case installations. Adapters are provided for mounting in up to 37-inch deep racks. They are primarily designed for rugged Military applications but can be used in Industrial, Commercial, or Broadcast applications where reliability, quality and long program life availability preclude the use of cheaply made imported units.

A choice of two sealed keyboards is offered providing either a Touchpad or Hula Point pointing device. Both keyboards are NEMA-4 / IP65 rated sealed silicone rubber construction with tactile feedback and full travel for comfortable typing. Carbon on gold contacts assures reliable operation. The keyboards are rated for 10 million lifecycles per switch.

The Touchpad keyboard offers 97 keys with two mouse buttons while the Hula Pointer version offers 113 keys with three mouse buttons. Both PS/2 and USB outputs are standard with the Hula Point version while the Touchpad version is available only with USB output. The Touch Pad version is backlit. The keyboards are completely sealed to meet IP-65 to prevent liquid ingress so coffee and Coke spills don't faze them. The keyboards can be wiped down with a wet rag to clean any spills.

A built-in 4- port VGA KVM is available.

As with all Chassis Plans products, a wide variety of custom options can be configured per customer or application specific requirements. Contact your Sales Engineer to discuss your particular requirements.

## *Genesis Based LCD Controller*

The LCD Controller is a key component in any display system and no expense has been spared in specifying the Genesis controller used in the CCXR-17. This is a long life revision controlled military grade component. The Genesis chip set is the current gold standard for LCD controllers. The controllers support 3x8-bit 16.7 million colors at up to 1600x1200 scaled to 1280x1024 native panel resolution. Refresh rates of 60Hz for UXGA and SXGA with higher refresh rates for lower resolutions available. Computer input signals of VGA, SVGA, XGA, SXGA, WXGA and UXGA are supported. DVI inputs supports up to1600x1200 60Hz signals. This ruggedized military grade controller is rated for operating at -40 to +80 deg C, use low mass tantalum capacitors for maximum vibration and shock tolerance and are conformal coated for extreme ruggedness. MTBF for the controllers is in excess of 200K hours.

The controller will provide input scaling of virtually any input signal to scale the image to the 1280x1024 native LCD panel resolution. They provide for PC, Apple and Sun input resolutions.

## *Friction Slides*

Rugged General Devices friction slides have been specified. Ball bearing slides are a weak point in any rackmount keyboard design and the use of friction slides negates those problems. Using friction slides allows the keyboard to stay at the position you place it without the use of troublesome lock-outs. Friction slides also have a very high tolerance for dust and dirt that typically destroys ball bearing slides in very short order.

Ultra high quality milled aluminum Jonathon slides are optionally available as specified.

## *Photos*

**Photo 1- Front View – Open**

**Photo 2- Front View – Closed**

**Photo 3- Top View of Keyboard Area (w/ KVM)**

**Photo 4- Side View**

**Photo 5- Rear View w/ 4-Port KVM**

**Photo 6- NEMA-4 / IP65 Keyboard w/ Hula Point**

**Photo 7- NEMA-4 / IP65 Keyboard w/ Touch Pad**

## *Specifications*

### Enclosure
1U (1.71") x 24.6" deep
Front Panel milled 5052 aluminum alloy
Body made of 5052-H32 aluminum alloy
All stainless steel hardware
All self-locking pressed in fasteners where appropriate
Powder coat black, medium texture, for ruggedness Other colors optionally available
Designed to Mil-Spec Standards to Satisfy Military, Industrial and Commercial Requirements
Compact Enclosure for Limited Depth Installation
Weight: 35lbs (w/o KVM)
38lbs (w/ KVM)

### 17" Display
17" TFT LCD 1280x1024
1.1mm soda lime glass ITO filter bonded to display
1.1mm soda lime glass AR filter bonded to ITO filter
Display Colors: 16.7 Million
Response Time: 16mS Typical
Viewing Angle: 80 deg
Contrast Ratio: 1000:1 typical native
1300:1 w/ bonded AR filter
Brightness: 380cd/m2 typical
Pixel Pitch: 0.264mm x 0.264mm
Pixel Arrangement: R.G.B Stripe
Power Management: EPA Energy Star, VESA DPMS
Operating Temperature: 0 to + 50 Deg C
Storage Temperature: -10 to +60 Deg C

### POINTING DEVICE
Incorporated pointing device (mouse button) for precise tracking
3 Mouse buttons
Built in to silicone rubber keyboard
Hall sensor motion detection
Universal USB & PS/2 interface

### KVM
Max Video Resolution of 2048 x 1536 @ 60Hz
Power Consumption: 1.2W @ 5VDC

### KEYBOARD
Sealed silicone rubber keyboard
97 keys w/ 12 function keys and touch pad
113 Keys w/ 20 function keys and Hula Point
Integrated numeric pad
High quality carbon-on-gold contacts
Protection to NEMA 4 / IP65 dust & splash proof (coffee proof!)
Universal PS/2/USB Connection on 113 key version
USB only on 97-key version
Tactile Keystroke
10,000,000 lifecycles per switch

### POINTING DEVICE
Hula Point with 3 Mouse buttons
Touch Pad with 2 Mouse buttons
Built in to silicone rubber keyboard
Universal USB & PS/2 interface on 113-key Hula Point Keyboard
USB only on 97-key Touch Pad keyboard

### OPTIONAL FEATURES / OPTIONS
Integrated KVM Switch Options
Transflective LCD for Daylight Use
Enhanced Backlighting
Protective Glare and NVis Filters
Customer Specified Paint Color
Customer Logo
Custom sheet metal and mechanical features

### POWER SUPPLY OPTIONS
**AC Input**
100 to 260VAC, auto selecting
47-66 HZ

**12VDC Input Transient Filter**
Line transient protection for 12VDC vehicular applications

**Mil-Std-1275A DC/DC Converter**
True 1275 compliance for military 28VDC nominal vehicle inputs
18 to 36VDC input

**48VDC DC/DC Converter**
36 to 75VDC Input
Isolated Inputs for +/- input levels

See the appropriate power supply section for complete power supply specifications.

**Table 1 – Specifications**

| | |
|---|---|
| **LCD DVI/VGA Input Features:**<br>Inputs:<br>Analog RGB: 60Hz at SXGA, WXGA, XGA, SVGA, VGA<br>With auto detect of Digital Separate Sync, Sync-On-Green & Composite Sync. Auto detects VGA ~SXGA interlaced & noninterlaced.<br>DVI-D: 60Hz at SXGA, WXGA, XGA, SVGA, VGA<br>Image Scaling: Up / down scaling to fit input to panel resolution.<br>Image Control: Brightness, Contrast, Saturation, Hue, Frequency, Phase, Color temperature, Image position, Hue, Gamma.<br>Other Features: Auto picture setup, Auto RGB calibration, Auto source seek, OSD timeout, OSD position, Input source select, OSD menu lock, Direct key for brightness level adjustment. | |

**Table 2 – Genesis Video Controller Specifications**

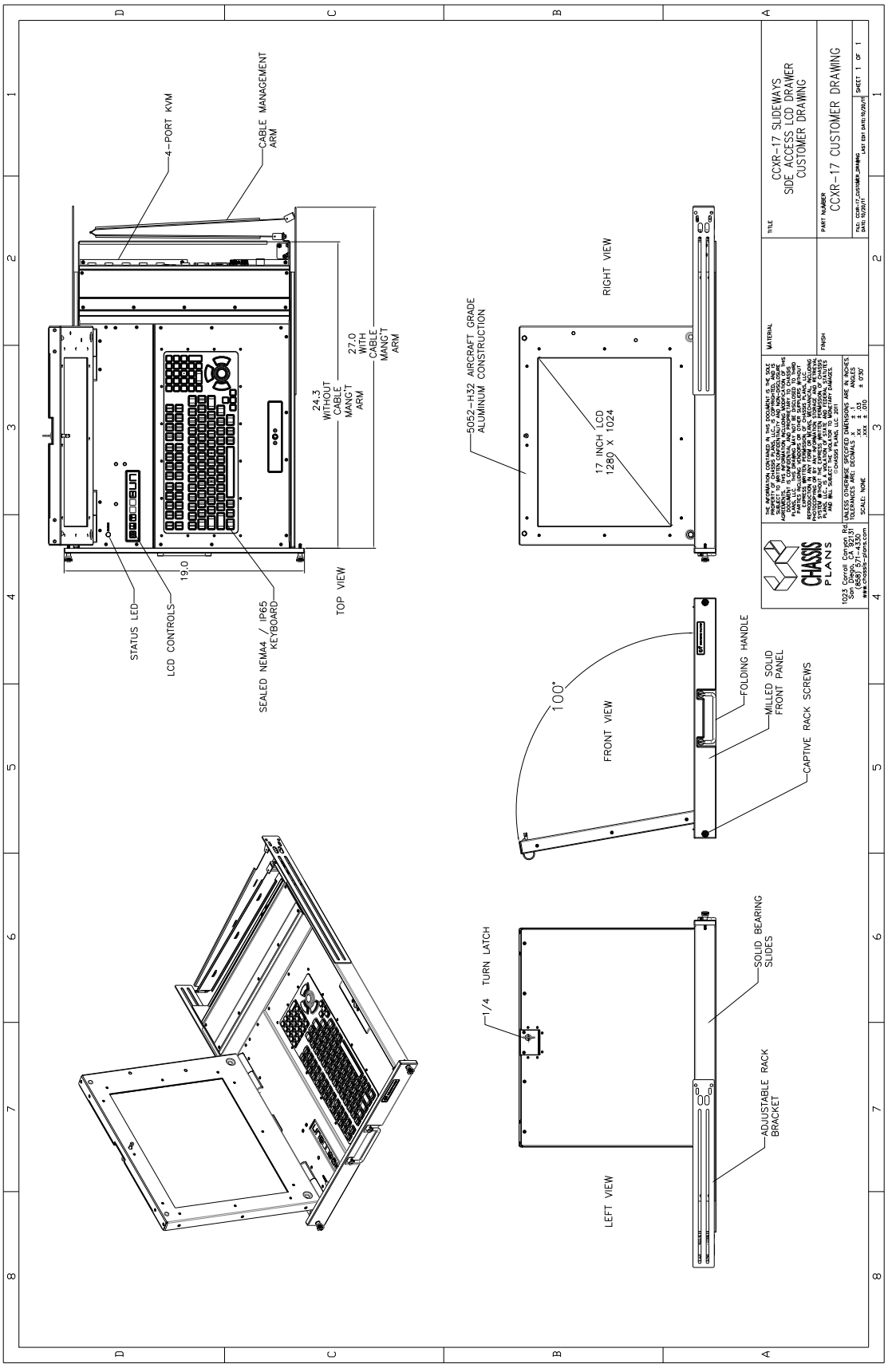


**Figure 1 – CCXR-17 Customer Drawing**

## *LCD Enhancements*

In the CCX family of rugged military grade LCD keyboard drawers, Chassis Plans starts with Grade A Industrial Quality LCD panels selected for optical performance, high reliability and long product life cycle. In order to not only ruggedize the LCD, but to also enhance the mechanical, optical and EMI properties of the finished unit Chassis Plans optically bonds 2 layers of coated 1.1 mm soda-lime float glass to the front of the LCD panel. The first layer is coated with an Indium Tin Oxide (ITO) coating with a surface resistivity of <13.5 ohms/sq. See Figure 2 for attenuation values.

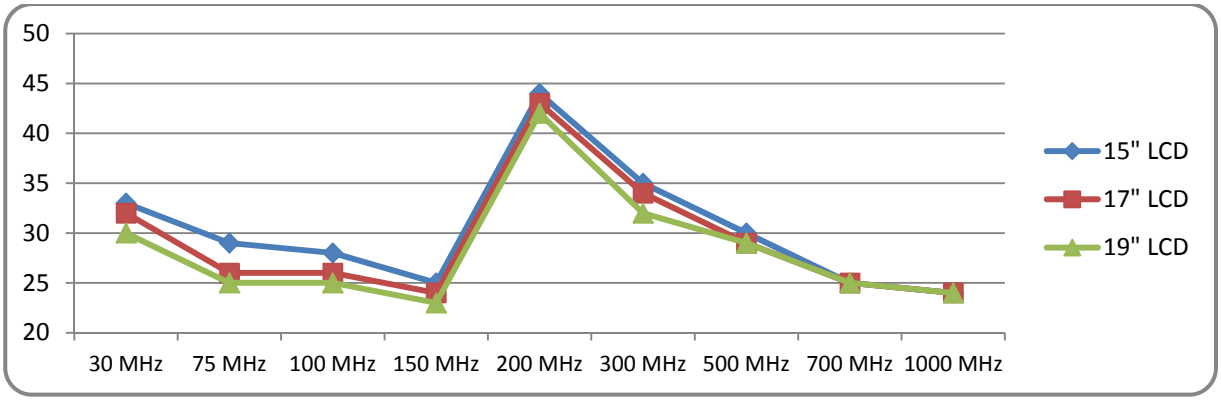


**Figure 2 – EMI Shielding Effectiveness of ITO Coating**

There is a Copper conductive buss bar that wraps around the edge of the glass to facilitate conduction from the ITO coating to the front surface of the laminated structure to make a complete electrical shield around the face of the LCD. See Figure 3 for details.

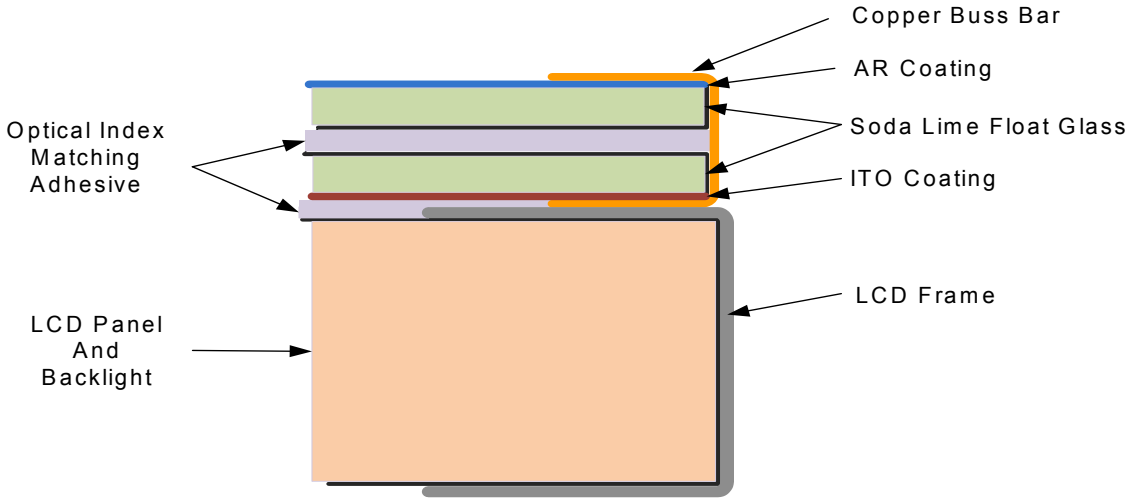


**Figure 3 – Optical Stack on LCD**

The second layer of glass is coated with an Anti-Reflective (AR) coating which matches the index of refraction of air to eliminate surface reflections. These layers of coated glass are bonded together with an index matching optical adhesive to eliminate internal reflections caused by the index of refraction mismatch between the soda lime glass and air. This eliminates over 95% of unwanted glare from the screen. Please see Figure 4 below for more details.

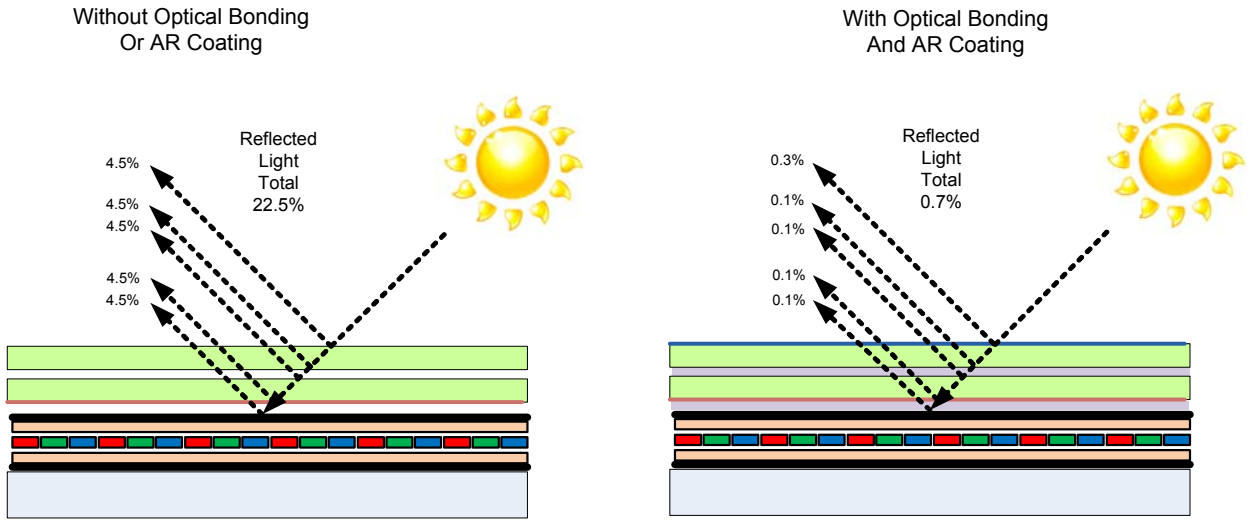


**Figure 4 – Comparison of Reflections with and without Optical Bonding**

The resulting structure has greatly enhanced optical characteristics in high ambient light conditions. The optical adhesive used is a silicone RTV and offers other benefits mechanically to the LCD as well. The adhesive remains pliable and therefore acts as a shock absorbing medium for the front of the LCD. Together with the additional layers of glass provides a very rugged composite structure. Another benefit is that should breakage actually occur the shards of glass will be retained together to prevent injury to personnel. The adhesive also prevents any condensation from building up in the air gap between the layers of glass which would cause fogging of the display. Finally, the added mass bonded to the front of the LCD display adds a thermal conduction path to help dissipate the heat generated in the backlights themselves.

By eliminating the majority of reflected light, the apparent contrast improves making the display more readable in high bright situations. An alternative to improving the contrast is to increase the back light levels to overpower the reflected light. The downside to this approach is the higher power requirements and higher heat generated by the backlights.

Photo Courtesy of
GDS Clearview

**Figure 5 – Comparison with and without Optical Bonding**

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# Chapter 2 – KVM Option

## *KVM Option*

The CCXR-17 is designed to interface with an optional four-port VGA KVM module. This KVM allows the one keyboard/display to control four VGA ports with PS/2 or USB keyboard/mouse signals. The KVM provides OSD control using keyboard hotkey commands. Four 6-foot 3-in-1 cables for connecting to up to four computer's VGA ports and keyboard/mouse (via PS/2 or USB) are provided. Additional cables and length options are available.

**Photo 8- CCXR-17 Rear Panel w/ KVM**

## *KVM Cables*

Only KVM cable sets which are specifically designed to work with this switch may be used to link to the computers. The system is provided with four 3 meter cables. Additional cables may be ordered as follows.

The cables provide an SPHD connector at the KVM end and connectors for VGA video, 1 x USB and 2 x PS/2 (keyboard and mouse) at the computer end.

| Connectors | Length | Part Number |
|---|---|---|
| USB, PS/2, VGA | 1.2 meters | 2L-5301UP |
| USB, PS/2, VGA | 1.8 meters | 2L-5302UP |
| USB, PS/2, VGA | 3 meters | 2L-5303UP |

**Table 3 – Genesis Video Controller Specifications**

**Note**:

1. The quality of the display is affected by the quality and length of the cables. If you need additional cable sets, please contact your Chassis Plans Sales Engineer to purchase the appropriate ones for your switch.

# *KVM Connection*

## Cable Connections

To set up your CCXR-17 with KVM, refer to the installation diagram on the following page (the numbers in the diagrams correspond to the steps below) and do the following:

1. Using the included short PS/2 and USB jumper cables, plug the outputs of the CCXR-17 Keyboard and Mouse (left side of rear panel) into the appropriate ports on the KVM side of the rear panel (right side).
2. Using the included short VGA jumper cable, plug the VGA input on the left side of the rear panel into the VGA output on the KVM side.

   **Note** – the CPU1-4 connections look like a HD15 VGA connector. On closer inspection, they are mirror images and you cannot plug a VGA cable into them. The VGA connector is the HD15 on the left of the 4 CPU connectors.

3. Using the custom KVM cable sets (provided with this package), plug the custom SPHD connector into any available socket in the KVM port section of the switch.
4. At the other end of the cables, plug the USB or PS/2 and VGA connectors into their respective ports on the computer.

   **Note** – if your computer supports both USB and PS/2, you should plug in both sets of cables.

5. If you choose to use external power, plug the power adapter into an AC power source, then plug the power adapter cable into the switch's Power Jack. The KVM is powered by 5VDC.
6. Turn on power to the computers.

## *KVM Installation Diagram*

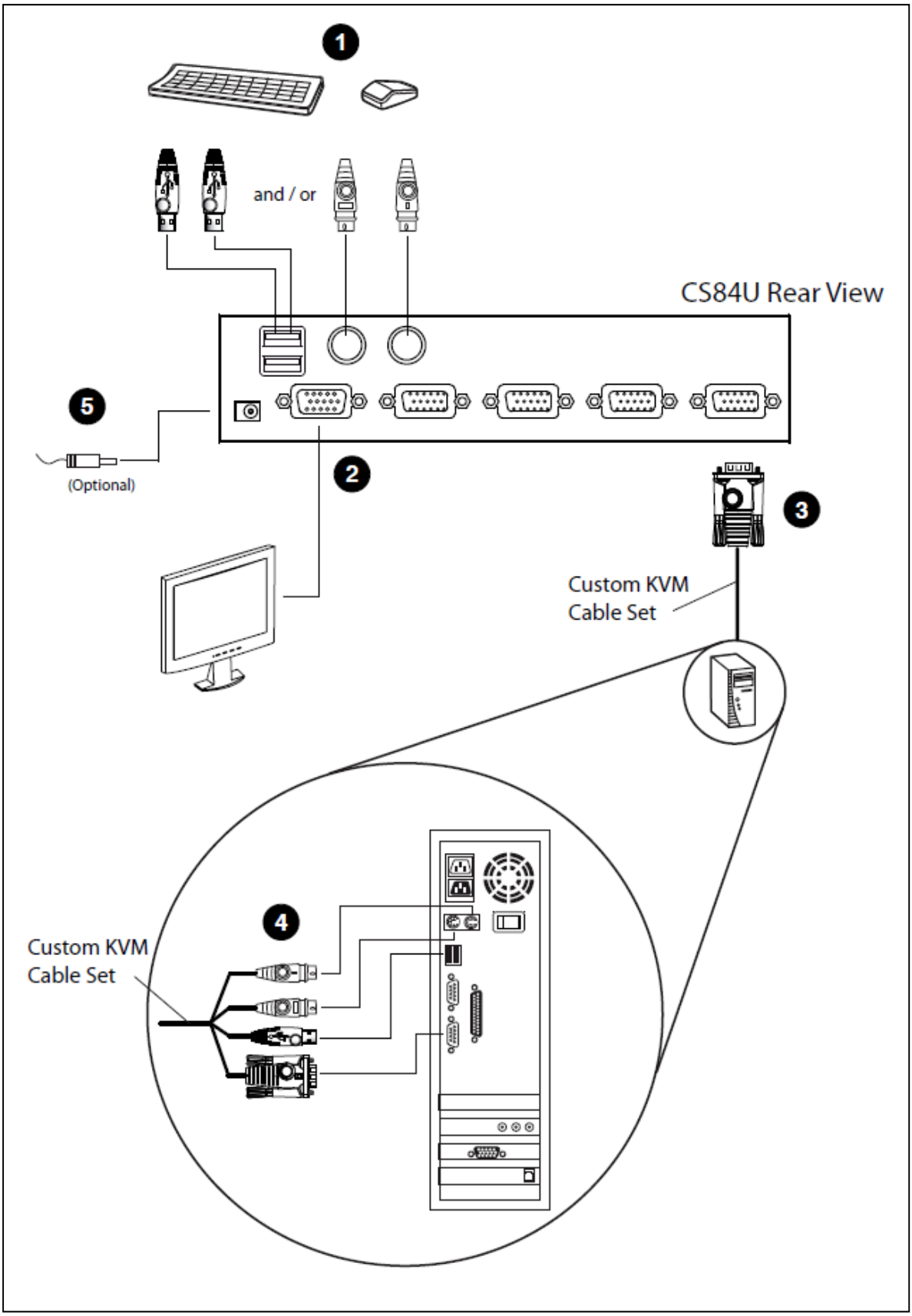


**Figure 6 – Comparison of Reflections with and without Optical Bonding**

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# Chapter 3 – Power Supply Options

## *AC Input Power Supply*

The AC Input Power Supply is a 65W Medical Grade “Brick” style power supply. The output is provided with a circular mil connector for connecting to the LCD Keyboard Drawer. The input accepts a standard IEC 320 plug. A bracket is provided to securely mount the supply in a rack.

Alternate AC supplies are available as required by the application or environmental requirements.

| | | | |
|---|---|---|---|
| **INPUT** | | **ENVIRONMENTAL** | |
| Voltage | 100-240VAC | Operating Temperature | 0 to 50°C |
| Current | 2.0A @ 100VAC | Storage Temperature | -40 to +85°C |
| Frequency | 50-60Hz | | |
| Input Connector | 3-Pin IEC 320 Receptacle | **SAFETY** | |
| | | cTUVus | |
| **OUTPUT** | | UL 60601-1 | |
| Total Regulation | < +/- 5% | CSA C22.2 No. 601.1-M90 | |
| Set Point Accuracy | < +/- 3% @ 60% Load | CB per IEC 60601-1 | |
| Hold-up Time | >12mS @ Full Load, 115VAC | CE marked to LVD | |
| | | Class I | |
| Over Voltage Protection | Built-in | | |
| Over Current Protection | Built-in | **EMI/EMC** | |
| Short Circuit Protection | Pulsing mode, auto recovery | Emissions | CISPR11 and FCC Part 15, Class B<br>EN61000-3-2, -3 |
| | | Immunity | EN61000-4-2, -3, -4, -5, -6, -9, -11 |
| **SIZE** | | | |
| L X W X H | 5.07” X 3.06” X 1.35” | | |
| Weight | 1.2 lbs | | |

**Table 4 - AC Input Supply Specifications**

**Photo 9 - AC Power Supply**

## *12VDC Input Transient Filter*

The CCX family display consoles require nominal +12VDC at 40W for operation. An EMI line filter is provided to limit EMI emissions and to provide a small measure of input filtering.

For operation from unregulated 12VDC (+/-10%) such as in a vehicular or marine environment, front end transient filtering is required to suppress potentially damaging spikes from large inductive loads in the DC circuit (starters, etc.).

The xxx 12VDC Input Transient Filter provides an input Transient Protection as well as inductive and capacitive filtering to suppress large input transients. A bridge rectifier provides reverse connection protection. A circuit breaker provides for failure protection and allows the power to be disconnected.

### Connectors

| | |
|---|---|
| Input Connector | MS3102A-10SL-3P (MIL-C-5015) |
| Mating Input Connector | MS3106A-10SL-3S (Straight)<br>MS3108A-10SL-3S (Right Angle) |
| Pinouts | Pin A – Positive<br>Pin B – Negative Input<br>Pin C – N/C |
| Output Connector | MS3102A-10SL-3S (MIL-C-5015) |
| Mating Output Connector | MS3106A-10SL-3S (Straight)<br>MS3108A-10SL-3S (Right Angle) |
| Pinouts | Pin A – Positive<br>Pin B – Negative<br>Pin C – N/C |

## *MIL-STD-704/1275 DC Input Converter*

The Mil-Std-704/1275 DC Input Converter provides true 704/1275 input specifications allowing reliable operation from nominal 28VDC input mains in a military environment. Amil grade DC to DC Converter is provided in a rack mountable case with military grade circular connectors. This supply meets Mil-Std-704A and Mil-Std-1275A (100V for 50mS).

### Operating Specifications

| | |
|---|---|
| Input Voltage | 18-36VDC |
| Output Voltage | 12.0VDC |
| Output Current | 5A |
| Output Power | 75W |
| Electrical Specifications | |
| Efficiency | 81% |
| Isolation | 200VDC, Input to Output and Input to Case |
| EMI Filtering | Mil-Std-461E, CD101 and CE102 on the input |
| Operating Temperature | -40°C to +85°C |
| Storage Temperature | -55°C to +100°C |

### Connectors

| | |
|---|---|
| Input Connector | MS3102A-10SL-4P (MIL-C-5015) |
| Mating Input Connector | MS3106A-10SL-4S (Straight)<br>MS3108A-10SL-4S (Right Angle) |
| Pinouts | Pin A – Positive<br>Pin B – Negative<br>Pin C –N/C |
| Output Connector | MS3102A-10SL-3S (MIL-C-5015) |
| Mating Output Connector | MS3106A-10SL-3S (Straight)<br>MS3108A-10SL-3S (Right Angle) |
| Pinouts | Pin A – Positive<br>Pin B – Negative<br>Pin C– N/C |

### Environmental Specifications

| | |
|---|---|
| Pressure-Altitude | Per MIL-STD-810F, Method 500.4, Procedure I and II |
| High Temperature | Per MIL-STD-810F, Method 501.4, Procedure I and II |
| Low Temperature | Per MIL-STD-810F, Method 502.4, Procedure I |
| Humidity | Per MIL-STD-810F, Method 507.4, Procedure I |
| Fungus | Per Mil-Std-810F, Method 508.5, Procedure I |
| Salt Fog | Per Mil-Std-810F, Method 509.4, Procedure I |
| Sand and Dust | Per Mil-Std-810F, Method 510.4, Procedure I and II |
| Explosive Atmosphere | Per Mil-Std-810F, Method 511.4, Procedure I |
| Acceleration | Per MIL-STD-810F, Method 513.5, Procedure I and II |
| Vibration | Per MIL-STD-810F, Method 514.5, Procedure I, Category 1, 4, 7 thru 14 and 16 thru 21 |
| Shock | Per MIL-STD-810F, Method 516.5, Procedure I, IV |

**Table 5 - MIL-STD-704 Power Supply Specifications**

## *+/-48VDC Power Supply*

The xx 48VDC Input Converter provides universal isolated 48VDC input, either positive or negative input. Thus it can be used in a data center with centralized power of +48VDC as well as a central office with -48VDC mains. The system is provided in a rack mountable case with military grade circular connectors.

| **Operating Specifications** | |
|---|---|
| Input Voltage | 36-75VDC |
| Output Voltage | 12.0VDC |
| Output Current | 10A |
| Output Power | 120W |
| **Connectors** | |
| Input Connector | MS3102A-14SL-7P (MIL-C-5015) |
| Mating Input Connector | MS3106A-14S-7S (Straight)<br>MS3108A-14S-7S (Right Angle) |
| Pinouts | Pin A - Positive<br>Pin B – Negative |
| Output Connector | MS3102A-10SL-3S (MIL-C-5015) |
| Mating Output Connector | MS3106A-10SL-3S (Straight)<br>MS3108A-10SL-3S (Right Angle) |
| Pinouts | Pin A – Positive<br>Pin B – Negative<br>Pin C– N/C |

| **Electrical Specifications** | |
|---|---|
| Efficiency | 92% |
| Isolation | 1500VDC, Input to Output and Input to Case |
| EMI Filtering | Mil-Std-461E, CD101 and CE102 on the input |
| Operating Temperature | -40°C to +85°C |
| Storage Temperature | -55°C to +125°C |

**Table 6- 48VDC Power Supply Specifications**

# Chapter 4 – Ordering Information

**CCXR** = CP Clamshell Industrial Right Side Mount Base Unit

**Keyboard Options:**
**A** = NEMA 4/IP65 113-Key with pointing device (PS/2 or USB)
**B** = NEMA 4/IP65 97-Key with touchpad (USB)

**Head Unit Options:**
**171A** = 17" LCD with 3mm bonded safety glass and EMI filter
**171B** = 17" LCD, no safety glass or EMI filter option

**VIDEO INPUT OPTIONS**
**C1** = VGA, DVI-D

**POWER OPTIONS**
**A** = AC 110V 100-264VAC 50/60Hz
**B** = 12VDC
**C** = MIL-STD-704 (28VDC Nominal)

**KVM OPTIONS**
**N** = No KVM
**A** = 4 Port VGA, PS/2 & USB

**Example Part Number CCXR-A171AC1-AA =** CCXR-17 w/ 113 key keyboard, bonded LCD AR and ITO filters, VGA/DVI-D video inputs, 110VAC power supply and 4-port VGA KVM.

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# Chapter 5 - Package Contents

| Part Description | Quantity |
|---|---|
| LCD Keyboard Assembly | 1 |
| Power Supply | 1 (if P/S spec'd in part number) |
| Power Supply Rack Bracket | 1 (if P/S spec'd in part number) |
| 10-32 x 1" Pan Head Screws | 12 |
| Plastic Rack Washers | 12 |
| 10-32 Cage Nuts | 12 |
| 10-32 Nuts | 12 |
| Power Cord Kit – (Note 1) | 1 |
| Manual | 1 |
| Rack Ruler | 1 |
| | |
| KVM | 1 (if specified in part number) |
| KVM to Computer Interface Cable | 1 (if KVM spec'd in part number) |
| PS/2 Jumper Cable2 | 2 (if KVM spec'd in part number) |
| USB Jumper Cable | 1 (if KVM spec'd in part number) |
| KVM Fan-Out Cable | 4 ((if KVM spec'd in part number) |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

**Table 7 - Package Contents**

**Notes:**

1. **Power Cord Kit** – For the AC input supplies, a standard 6-foot North American IEC-320 power cord is provided. For the DC input supplies, a kit is provided with a mating Mil Circular connector, backshell, and pins allowing the user to fabricate an appropriate cable for the intended application. For volume orders, Chassis Plans can provide pre-fabricated power cables per the end use specifications.

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# Chapter 6 - Installation

## *Rack Installation*

To mount the CCXR-17 in a rack, it is first important you identify the correct holes to mount to. Please see the following illustration. Note that a 'U' starts between the holes that are ½" apart. One very common problem is trying to install into the wrong holes.

Because there are multiple styles of racks, it is not possible to provide detailed instructions on mounting the equipment. However, there are general instructions at http://www.chassis-plans.com/PDF/Rack_Slide_Use.pdf for rack installation which should help.

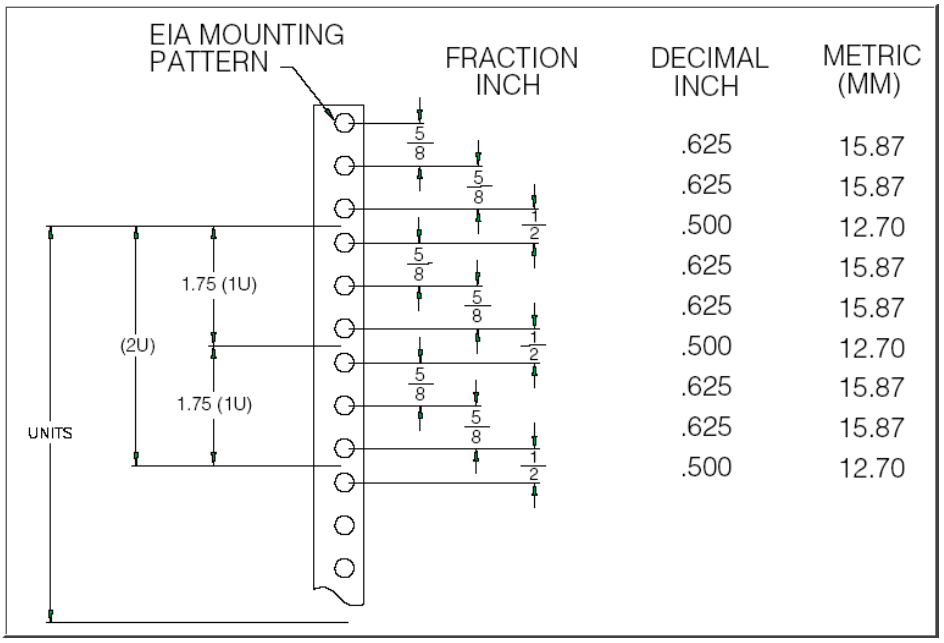


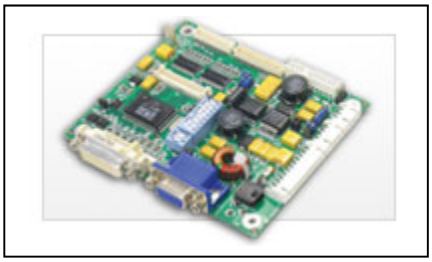

**Figure 7 - Rack Mounting Hole Spacing**

Chassis Plans offer free Rack Rulers to assist in installing equipment into racks. You should have received one with your order. To request more, fill out the short form at http://www.chassis-plans.com/form_rack_ruler.html and we'll send you as many as you want. These are invaluable for installing systems into racks.

## *Connecting the Display*

The CCXR-17 provides for a single controller option with rear panel details provided below.

## *LCD Controller Rear Panel Connections*



The LCD controller provides for DVI and VGA inputs. In addition, the rear of the display provides for Keyboard and Pointing Device outputs plus a Circular Mil connector for power connection. If you have purchased a KVM option, then the KVM control cable connector will be present. The sealed keyboard with built-in pointing device offers universal output providing USB and PS/2 outputs for the keyboard and 'mouse' devices.

The LCD controller offers the following features:

Inputs:
- Analog RGB: 60Hz at SXGA, WXGA, XGA, SVGA, VGA With auto detect of Digital Separate Sync, Sync-On-Green & Composite Sync. Auto detects VGA ~SXGA interlaced & noninterlaced.
- DVI-D: 60Hz at SXGA, WXGA, XGA, SVGA, VGA

Image Scaling: Up / down scaling to fit input to native panel resolution of 1280x1024.

Image Control: Brightness, Contrast, Saturation, Hue, Frequency, Phase, Color temperature, Image position, Hue, Gamma.

Other Features: Auto picture setup, Auto RGB calibration, Auto source seek, OSD timeout, OSD position, Input source select, OSD menu lock, Direct key for brightness level adjustment.

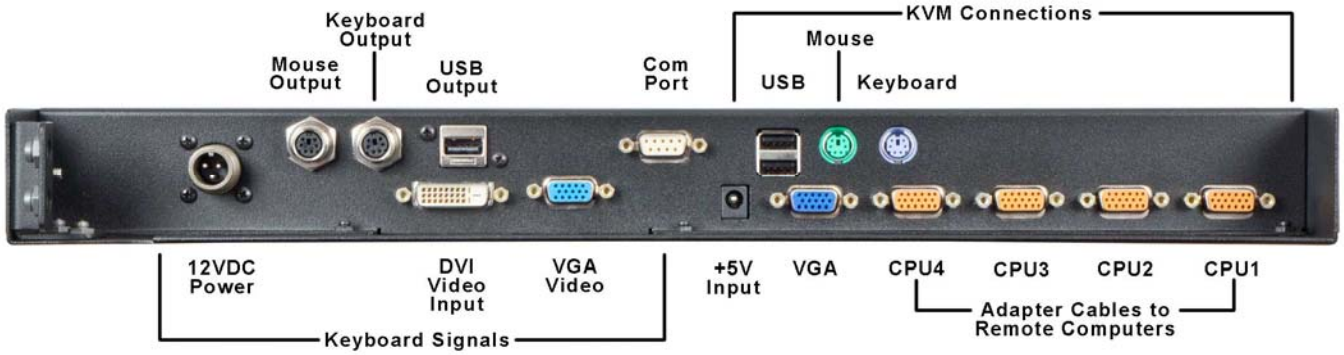



**Photo 10 – LCD Controller Rear Panel I/O w/ KVM**

Table 8, following, details the connectors for the CCXR-17 with KVM installed. For installations without the KVM, disregard the second part of the table and connect the computer signals utilizing the included cables as indicated.

| J# | Legend | Function | Connector on KVM | Notes |
|---|---|---|---|---|
| **Keyboard and LCD Signals** | | | | |
| J8 | 12VDC Power | Input Power, 12VDC +/-5% | Circular Mil N/S 3102A-10SL-3P | |
| J4 | MSE | Mouse PS/2 Output | PS/2 - Locking | 1 |
| J3 | KBD | Keyboard PS/2 Output | PS/2 - Locking | 1 |
| J1 | USB | Keyboard/Mouse USB Output | USB Type 'A' | 2 |
| J6 | DVI-D | DVI-D Video Input | DVI-D Connector | 3 |
| J7 | VGA | VGA Video Input | HD15 Female | 4 |
| J2 | Com | Remote RS232 Control Port | DB9 Male | 6 |
| | | | | |
| **KVM Connections** | | | | |
| | +5V Input | Aux 5VDC Input – Not Used | Barrel Connector | |
| J9 | USB | USB Input – 2 Ports | USB Type 'A' | 2 |
| J10 | MSE | Mouse PS/2 Input | PS/2 Non-Locking | 1 |
| J11 | KBD | Keyboard PS/2 Input | PS/2 Non-Locking | 1 |
| J12 | VGA | VGA Input | HD15 Female | 4 |
| J13 - 16 | CPU1 – 4 | KVM Outputs to Computers | HD15 Female (Inverted Pinout) * | 5 |

**Table 8 - Rear Panel Connections**

**Note**:

1. The keyboard outputs on both USB and PS/2 including the mouse pointer. Depending on the computer to be interfaced to, either output can be utilized. Connect the Keyboard MSE (J4) and KBD (J3) outputs to the KVM MSE (J10) and KBD (J11) inputs using the included short jumper cables for PS/2 signals.
2. The keyboard and mouse pointer USB outputs are combined into one USB connector J1. This can be connected to either port of the KVM USB input J9 utilizing the included short USB jumper cable.
3. The KVM does not provide for DVI video though this input to the LCD can be using in addition to the VGA input. The displayed input is controlled via the LCD controls on the front of the unit.
4. The VGA input (J7) to the LCD should be connected to the VGA output (J12) on the KVM utilizing the included short VGA jumper cable.
5. The connectors for the CPU1-4 (J12-16) KVM outputs appear to be high density VGA connectors. However, on closer examination as compared to the VGA connector (J12), you'll see the pin out pattern is mirrored to prevent inadvertent connection to a VGA cable. Proprietary fan-out cables must be used to separate out the VGA, PS/2 and USB signals for connection to the computers.
6. The LCD controller offers remote serial port control through the RS232 Control Port. See Appendix 1 for details on port pin out assignment and commands.

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# Chapter 7 – LCD Operation

## *Opening the LCD*

The LCD is equipped with a ¼-turn fastener to secure the LCD panel in the closed position for installation in environments with high levels of shock and/or vibration.

To access the LCD, lift the bail, turn the fastener ¼ turn and then lift the display up into its operating position. See Photo below.

**Photo 11 – LCD Latch**

## *Closing the LCD*

> ***Important Warning***
> *Before closing the display, assure that nothing such as pens or USB thumb drives have been left inside the keyboard area. Closing the display with something in this area will damage the display. This is not covered under warranty.*

To close the LCD, push it down to the closed position, engage the ¼-turn latch, and fold down the bail.

## *LCD Front Panel Controls*

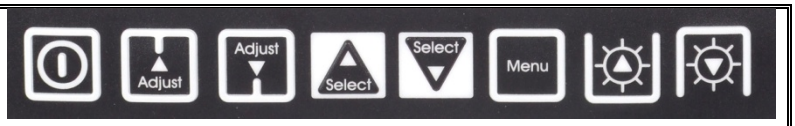
The On Screen Display (OSD) is adjusted as follows:

1. Press the **Menu** Button located on the front of the monitor.
2. Use the buttons described below to maneuver around the Menu.
3. Select the desired OSD Menu from the Menu Screen Shots below to make the desired adjustment(s).
4. Press the **Menu** button to exit out of the OSD Menu when complete or wait for the OSD window to automatically close as set by the OSD Time Out setting.

- **Power:** Turns the Unit On and Off
- **Adjust ▲:**
  - o Hot Key 1 ***Increase***
  - o When the cursor is not showing in sub menus, moves selection ***right*** between top tabs.
  - o Cursor showing in sub menus, adjusts setting ***up***.
  - o Cursor on sub-sub menu (► showing), enters sub-sub menu. (See Select ▲ below to escape).
  - o Toggles ***Off*** to ***On***
- **Adjust ▼**:
  - o Hot Key 1 Decrease
  - o When the cursor is not showing in sub menus, moves selection ***left*** between top tabs.
  - o Cursor showing in sub menus, adjust setting ***down***
  - o Toggles ***On*** to ***Off***
- **Select ▲:**
  - o Hot Key 2 ***Increase***
  - o Moves the cursor ***up***.
  - o When in a sub-sub menu, repeatedly press to move to the previous menu level. (See Adjust ▲ above)
- **Select ▼:**
  - o Hot Key 2 ***Decrease.***
  - o Moves the cursor ***Down***.
- **Menu**
  - o Opens or closes the OSD menu
  - o See Note 1 below for additional information.
- **Brightness ▲:**
  - o ***Increases*** the screen brightness.
- **Brightness ▼:**
  - o ***Decreases*** the screen brightness.

LED: Green-Normal Operation

| | |
|---|---|
| **Green** | Normal Operation |
| **Red** | Power On but no input signal |
| **Off** | No power or display turned off |




**Hot Keys**
Hot Keys are defined in the Utility/Hot Key menu and allow single button access to the defined function.

**Adjust ▲ and ▼** - Hot Key 1 Up and Down

**Select ▲ and ▼** - Hot Key 2 Up and Down

**Display Auto Adjust**
Pressing **Auto/Exit** will perform a auto display adjustment when in aRGB mode. This automatically adjusts the Phase and Clock for the est displayed image.

To save your changes, press the front panel **Menu** button. Alternatively, changes are saved if no buttons are pressed and the OSD times out returning back to the display.

**Notes On the Menu Buttons –**

1. The Menus are context sensitive in that only adjustments pertaining to the selected input will be displayed. For example, if DVI is selected for the input, then items such as Hue will not be adjustable.
2. Pressing the Menu button returns to the previously opened menu.

**Notes on Hot Keys -**

1. Hot Keys allow single button selection of a function.
2. Definition of the Hot Keys is set in the Utility menu. Thus, for example, if the Adjust keys are set up for Input Source, pushing the Up button rolls Up through the Input Sources and pushing the Down button rolls Down through the Input Sources.
3. The Hot Keys display in the upper left of the screen when pushed.

**Note on Factory Default –**

1. Under the Utilities Menu, a selection is available to return the board setting to the factory defaults.

**Table 9 - Front Panel Controls**

## *OSD Menus*

| | | | |
|---|---|---|---|
| | **Select input source** | | |
| | | **Input source 1** | Select input source to Analog RGB |
| | | **Input source 2** | Select input source to DVI |
| | | **Auto Source Seek** | ON – Auto source select always enable<br>OFF – Disable auto source select function |
| | | **Wide screen mode information display*** | Select the input mode (1280 / 1360 / 1366 / 1368) to recognize and display the correct input signal information display on the OSD menu.<br>1280 : 1280x768<br>1360 : 1360x768<br>1366 :1366x768<br>1368 : 1368x768 |
| | | **Exit** | Exit the OSD menu and save the settings |
| | **Brightness and Contrast** | | |
| | | **Brightness** | Increase/decrease brightness level.<br>Press – or + (- + ) Total : 256 steps |
| | | **Contrast** | Increase/decrease panel contrast level.<br>Press – or + (- + ) Total : 192 steps |
| | | **Exit** | Exit the OSD menu and save the settings |
| | **Color** | | |
| | | **Auto RGB Calibration*** | Yes No ( Auto Color Calibration [See appendix IV]) |
| | | **Color Temperature** ▸ | (Adjust the warmness of the image displayed. The higher temperature the coolest image looks like. The lower temperature the warmest image looks like.) |
| | | | Adjust red color level<br>Press – or + (- +) Total :128 steps<br>Adjust green color level<br>Press – or + (- +) Total : 128 steps<br>Adjust blue color level<br>Press – or + (- +) Total : 128 steps<br><br>Press SEL UP/DN button to select item |
| | | 4200k | Set the color temperature to 4200K |
| | | 5000k | Set the color temperature to 5000K |
| | | 6500k | Set the color temperature to 6500K |
| | | 7500k | Set the color temperature to 7500K |
| | | 9300k | Set the color temperature to 9300K |
| | | **Gamma adjustment** ▸ | Adjust Gamma settings (0.4 / 0.6 / 1.0 / 1.6 / 2.2) |
| | | 0.4 | Select Gamma to 0.4 |
| | | 0.6 | Select Gamma to 0.6 |
| | | 1.0 | Select Gamma to 1.0 |
| | | 1.6 | Select Gamma to 1.6 |
| | | 2.2 | Select Gamma to 2.2 |
| | | **Exit** | Exit the OSD menu and save the settings |

**Table 10 - LCD Controller OSD Menus (cont)**

| | | | |
|---|---|---|---|
| | **Position** | | |
| | Auto | **Autosetup*** | Auto adjust the positions, phase, frequency<br>Yes No |
| | | **Frequency*** | Adjust the image horizontal size |
| | | **Phase*** | Fine tune the data sampling position (adjust image quality) |
| | | **Image Horizontal Position*** | Use +/- to move the image horizontally<br>Press – or + (- + ) |
| | | **Image Vertical Position*** | Use +/- to move the image vertically<br>Press – or + (- + ) |
| | | **Exit** | Exit the OSD menu |
| | **Utilities** | | |
| | | **OSD setting** ▸ | |
| | | | OSD Timeout : 0 / 10 / 20 / 30 / 40 / 50 / 60 seconds (Always on when set to 0)<br>Press – or + (- + ) |
| | | | OSD menu horizontal position<br>Press – or + (- + ) |
| | | | OSD menu vertical position<br>Press – or + (- + ) |
| | | **Load Factory Default** | Initialize the setting stored in non-volatile memory |
| | | **Sharpness** | Adjust sharpness level<br>Press – or + (- + ) Total : 7 steps |
| | | **Exit** | Exit the OSD menu |
| | Exit the OSD menu | | |

**Table 11 - LCD Controller OSD Menus**

# Chapter 8 – KVM Programming

## *Powering Off and Restarting*

The KVM is self-powered in that it is powered by connections to the CCXR-17 and the connected computers. To turn the KVM off, it is necessary to remove all external power coming through the connected cables. If it becomes necessary to power off the KVM, before starting it back up, you must do the following.

1. Shut down all the computers that are attached to the switch. Alternatively, disconnect all cables to the KVM.
2. Remove power from the CCXR-17 by removing the power connector or unplugging the remote power supply brick.
3. Unplug the KVM aux power plug if connected. (Not normally connected)
4. Wait 10 seconds, then reconnect cables or turn on computers.

## *Port ID Numbering*

Each KVM port selection is assigned a port number, 1 to 4. The port numbers are marked on the rear of the keyboard enclosure with CPU1 being to the far right and proceeding left to CPU4. These port numbers are referenced by the *Port Switching* functions.

## *Hotkey Programming*

The CCXR-17 KVM provides an extensive, easy-to-use hotkey function that makes it convenient to control and configure the KVM from the keyboard.

## *Port Switching*

All port switches begin with tapping the **[SCROLL LOCK]** key twice. The tables below describe the actions that each combination performs.

**Note**: If using the **[SCROLL LOCK]** key conflicts with other programs running the computer, the **[CTRL]** key can be used instead. See *Alternative Port Switching Keys* for details.

### Cycling Through the Ports

| Hotkey | Action |
|---|---|
| [SCROLL LOCK] [ SCROLL LOCK] [ENTER] | Switches to the next port. |

**Table 12- Cycling Through the Ports**

### Going Directly to a Port

| Hotkey | Action |
|---|---|
| [SCROLL LOCK] [ SCROLL LOCK] [**N**] [ENTER] | Switches to port '**N**' where '**N**' is 1, 2, 3, or 4. |

**Table 13- Going Directly to a Port**

## Auto Scanning

| Hotkey | Action |
|---|---|
| [SCROLL LOCK] [ SCROLL LOCK] [A] [ENTER] | Invokes Auto Scan mode. The KVM switches from port to port at 5 second intervals. Five seconds intervals is the Default setting. |
| [SCROLL LOCK] [ SCROLL LOCK] [A] [ENTER] [N] | Changes the scan interval per the following for 'N':<br><br>1 – 3 Seconds<br>2 – 5 Seconds (Default)<br>3 – 10 Seconds<br>4 – 20 Seconds |

**Table 14- Auto Scanning**

**AUTO SCAN NOTES**

1. While Auto Scan Mode is in effect, ordinary keyboard and mouse functions are suspended. Only Auto Scan Mode compliant keystrokes and mouse clicks can be input. You must exit Auto Scan Mode in order to regain normal control of the console.
2. Although the video focus switches from port to port, the keyboard and mouse do not switch. They stay at the port they were on when Auto Scanning started.
3. To exit Auto Scan Mode, Press the **[ESC]** key or the **[SPACEBAR].**

# *Hotkey Setting Mode (HSM)*

Hotkey Setting Mode is used to set up the CCXR-17 KVM configuration. All operations begin with invoking the Hotkey Setting Mode (HSM).

## Invoking HSM

To invoke HSM, do the following:

1. Press and hold down **[NUM LOCK].**
2. Press and release **[-]** (hyphen or minus key)
3. Release **[NUMLOCK]**

**Note**:

1. There is an alternate key combination to invoke HSM.
2. The minus key must be released within one half second, otherwise Hotkey invocation is cancelled.

When HSM is active, the Caps Lock and Scroll Lock LEDs flash in succession to indicate that HSM is in effect. They stop flashing and revert to normal status when you exit HSM.

Ordinary keyboard and mouse functions are suspended. Only Hotkey compliant keystrokes and mouse clicks (described in the sections that follow) can be input.

At the conclusion of some hotkey operations, you automatically exit hotkey mode. With some operations you must exit manually. To exit HSM manually, press the **[ESC]** key or the **[SPACEBAR]**

In the following settings, a key to press is represented as **[x]**. Do not press the **'[**' or '**]**' keys, just the letter or key within the brackets.

## Alternate HSM Invocation Keys

An alternate set of HSM invocation keys is provided in case the default set conflicts with programs running on the computers.

To switch to the alternate HSM invocation set, do the following:

1. Invoke HSM (page 38)
2. Press and release **[H]**.

The HSM invocation keys become the **[CTRL]** key instead of **[SCROLL LOCK]** and the **[F12]** key instead of the **[-]** (minus) key.

## Alternate Port Switching Keys

The port switching activation keys can be changed from tapping the **[SCROLL LOCK]** twice to tapping the **[CTRL]** key twice. To change the port switching activation keys, do the following:

1. Invoke HSM (page 38)
2. Press and release **[T]**.

**Note**:

1. This procedure is a toggle between the two methods. To revert back to the original **[SCROLL LOCK]** method, invoke HSM, then press and release **[T]** again.

## Keyboard Language

To change the keyboard language, do the following:

1. Invoke HSM (page 38)
2. Press **[F6] [nn] [ENTER]** where '**nn**' is 33 for US English, 08 for French or 15 for Japanese.

## Keyboard Emulation Control

To enable/disable Keyboard Emulation Control, do the following:

1. Invoke HSM (see page 38)
2. Press **[N]**

**Note**:

1. When Keyboard Emulation is disabled, the [**M**], [**W**], [**F2**], [**F3**], [**F10**], [**F4**], [**F5**] and [**F6**] hotkeys are disabled.

## Other OS Mode

To reset keyboards and mice for operating systems that do not support USB 2.0, do the following:

1. Invoke HSM (see page 38)
2. Press **[F1]**

## Keyboard Operating System Platform

The CCXR-17 KVM's default port configuration is for PC compatible keyboard operating system. If your console uses a PC compatible keyboard and you have a MAC attached to a port, for example, you can change the port's keyboard operating platform configuration so that the PC compatible keyboard emulates the MAC keyboard. The procedure is as follows:

1. Bring the KVM focus to the port you want to set.
2. Invoke HSM
3. Press and release the appropriate Function key as follows. After completing the procedure, you automatically exit HSM.

| Function Key | Operation |
|---|---|
| **[F2]** | Enables MAC keyboard emulation. See MAC Keyboard for details |
| **[F3]** | Enables Sun keyboard emulation. See Sun Keyboard for details |
| **[F10]** | Disables Keyboard Emulation. Key presses are passed straight through. This would be used if a MAC keyboard was connected to the KVM communicating with a MAC computer. |

**Table 15- Keyboard Operating Platform**

## List Switch Settings

To see a listing of the current switch settings, do the following:

1. Open a text editor or word processor and place the cursor in the page window.
2. Invoke HSM (see page 38)
3. Press and release **[F4]** to display the settings.

## USB Reset

If the USB loses focus and needs to be reset, do the following:

1. Invoke HSM (see page 38)
2. Press and release **[F5]**.

## Hotkey Buzzer Control

The buzzer can be toggled on and off using a hotkey sequence as follows:

1. Invoke HSM (see page 38)
2. Press and release **[B].**

## Disable Port Switching Keys

To disable the Port Switching Keys (**[SCROLL LOCK][SCROLL LOCK]** or **[CTRL][CRTL]**) do the following:

1. Invoke HSM (see page 38).
2. Press **[X][ENTER]**.

This is a toggle. To enable Port Switching, repeat steps 1 and 2.

## Firmware Upgrade Mode

To set the KVM to Firware Upgrade Mode, do the following:

1. Invoke HSM (see page 38)
2. Key in “upgrade’ (no quote marks) on the keyboard.
3. Press **[ENTER]**.

**Note**:
1. To exit Firmware Upgrade mode, you must power off the switch.

## Restore Default Settings

To reset the KVM to its default hotkey settings, do the following:

1. Invoke HSM (see page 38)
2. Press **[R][ENTER]**

See *Hotkey Default Settings*.

## Video DynaSync

To invoke Video DynaSync, exclusive technology that eliminates boot-up display problems and optimizes resolution when switching between ports, do the following:

1. Invoke HSM (see page 38)
2. Press **[D]**

## Mouse Port Switching

To enable/disable the Mouse Port Switching function, do the following:

1. Invoke HSM (see page 38)
2. Press **[W]**

**Notes**:
1. This procedure is a toggle.
2. The default setting is disabled.
3. This feature is only supported when mouse emulation is enabled.

## Mouse Emulation Control

To enable/disable Mouse Emulation, do the following:

1. Invoke HSM (see page 38)
2. Press **[M]**

## HSM Summary Table

After invoking HSM (see page 38), key in one of the following key combinations to perform the corresponding function.

| Function Key | Operation |
|---|---|
| **[H]** | Toggles between the default [NUM LOCK][-] and alternate [CTRL][F12] HSM invocation keys. |
| **[T]** | Toggles between the defauls [SCROLL LOCK][SCROLL LOCK] and alternate [CTRL][CTRL] Port Switching Keys. |
| **[F2]** | Enables MAC keyboard emulation mode. |
| **[F3]** | Enables Sun keyboard emulation mode. |
| **[F10]** | Disables keyboard emulation and activates pass through keyboard mode. |
| **[F4]** | Prints the KVM's current settings via a text editor or word processor. |
| **[F5]** | Performs a reset on all USB devices |
| **[F6][nn][ENTER]** | Sets the keyboard language.<br>nn = 33 US English, 08 French, 15 Japanese |
| **[B]** | Enables/disables the buzzer |
| **[X][ENTER]** | Enables/disables the port switching keys. |
| **[R][ENTER]** | Resets the hotkey setting to their default status. |
| **Type "upgrade" [ENTER]** | Invokes Firmware Upgrade Mode |
| **[D]** | Invokes Video DynaSync |
| **[N]** | Enables/disables keyboard emulation |
| **[M]** | Enables/disables mouse port switching |
| **[W]** | Enables/disables mouse port switching |
| **[F1]** | Resets keyboard and mouse under operating systems that do not support USB 2.0. |

**Table 16- HMS Summary Table**

# *Keyboard Emulation*

## MAC Keyboard

The PC compatible keyboard can emulate the functions of the MAC keyboard. The emulation mappings are listed below:

| PC Keyboard | Mac Keyboard |
|---|---|
| [Shift] | Shift |
| [Ctrl] | Ctrl |
| | |
| [Ctrl] [1] | |
| [Ctrl] [2] | |
| [Ctrl] [3] | |
| [Ctrl] [4] | |
| [Alt] | Alt |
| [Print Screen] | F13 |
| [Scroll Lock] | F14 |
| | = |
| [Enter] | Return |
| [Backspace] | Delete |
| [Insert] | Help |
| [Ctrl] | F15 |

**Table 17- MAC Keyboard Emulation**

**Note**:

1. When using key combinations, press and release the first key **[CTRL]**, then press and release the activation key.

## Sun Keyboard

The PC compatible keyboard can emulate the functions of the Sun keyboard when the Control key **[CTRL]** is used in conjunction with other keys. The corresponding functions are shown in the table below.

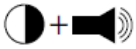
| PC Keyboard | Sun Keyboard |
|---|---|
| [Ctrl] [T] | Stop |
| [Ctrl] [F2] | Again |
| [Ctrl] [F3] | Props |
| [Ctrl] [F4] | Undo |
| [Ctrl] [F5] | Front |
| [Ctrl] [F6] | Copy |
| [Ctrl] [F7] | Open |
| [Ctrl] [F8] | Paste |
| [Ctrl] [F9] | Find |
| [Ctrl] [F10] | Cut |
| [Ctrl] [1] | |
| [Ctrl] [2] | |
| [Ctrl] [3] |  |
| [Ctrl] [4] | |
| [Ctrl] [H] | Help |
| | Compose |
| | |

**Table 18- Sun Keyboard Emulation**

**Note**:

1. When using key combinations, press and release the first key **[CTRL]**, then press and release the activation key.

## Hotkey Default Settings

| Setting | Hotkey | Default |
|---|---|---|
| **Port Switching** | **[T]** | [SCROLL LOCK][SCROLL LOCK] |
| **Invoking HSM** | **[H]** | [NUM LOCK][-] |
| **Auto Scan Interval** | **[SCROLL LOCK][SCROLL LOCK][A][ENTER]** | 5 Seconds |
| **Keyboard Operating Platform** | **[F10]** | PC Compatible |
| **Mouse Emulation** | **[M]** | Enabled |
| **Keyboard Emulation** | **[N]** | Enabled |
| **Mouse Port Switching** | **[W]** | Disabled |
| **Video DynaSync** | **[D]** | Enabled |
| **Port Switching Keys (On/Off)** | **[x][ENTER]** | Enabled |
| **Buzzer** | **[B]** | Enabled |
| **Keyboard Language** | **[F6][nn][ENTER}** | 33 - English |

**Table 19- Hotkey Default Settings**

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# Chapter 9 – KVM Firmware Upgrade Utility

The Windows based Firmware Upgrade Utility (FWUpgrade.exe) provides a smooth, automated process for upgrading the KVM switch's firmware. The Utility comes as part of a Firmware Upgrade Package that is specific for each type of KVM.

**Important Note**:

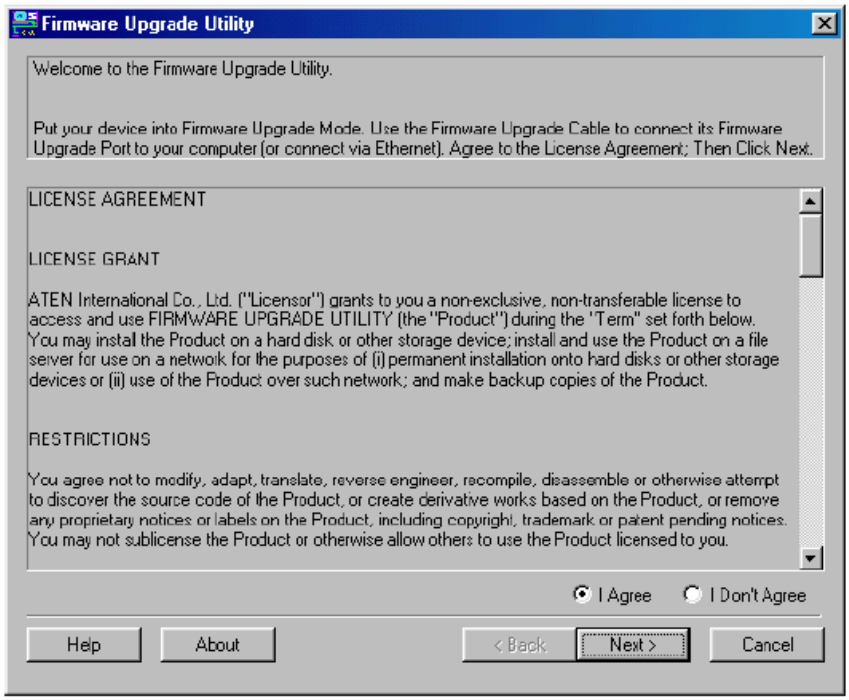
A firmware upgrade is generally not required unless you are having operation issues. Please check with the Chassis Plans Customer Service Department for instructions prior to uploading new Firmware into your CCXR-17 KVM. There are potential failure issues that require the unit be returned to Chassis Plans for repair if the Firmware upgrade is not successful.

## Before You Begin

1. From a computer that is not part of your KVM installation, download the appropriate Firmware package from Chassis Plans' website.
2. Disconnect the CCXR-17 from your KVM installation and power it off. Connect one of the custom KVM cable set's Type A USB connectors to a USB port on the computer to be used to install the new Firmware.
3. At the other end of the custom KVM cable set, connect the SPHD connector to Port 1 KVM section.
4. Invoke Firmware Upgrade Mode. See *Firmware Upgrade Mode*.

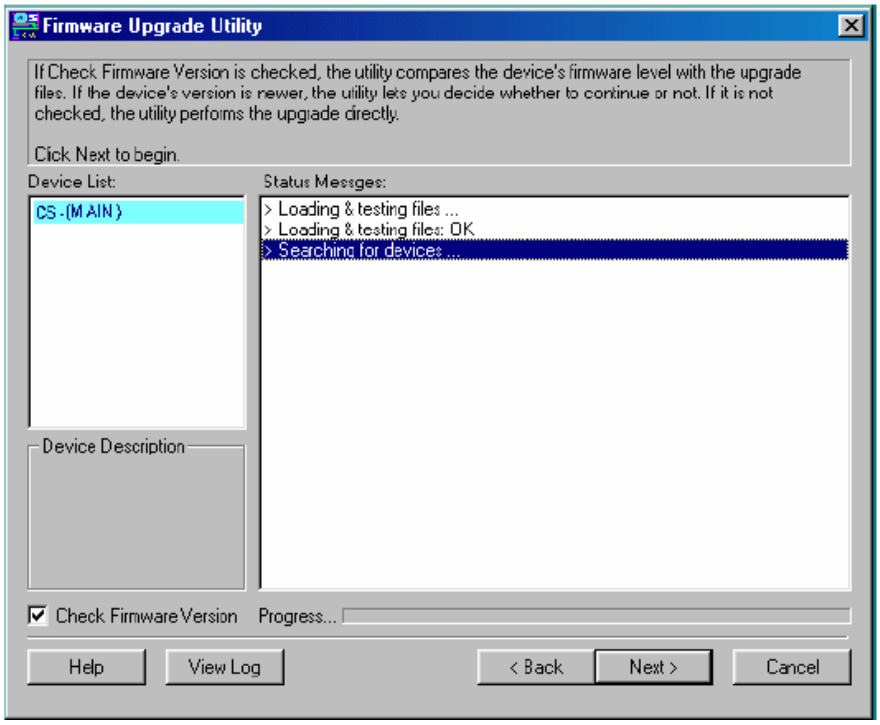
## Starting the Upgrade

1. Run the downloaded Firmware *Upgrade Package* file. The Firmware Upgrade Utility welcome screen appears.
2. Read the License Agreement and click on "I Agree".


Firmware Upgrade Utility
Welcome to the Firmware Upgrade Utility.
Put your device into Firmware Upgrade Mode. Use the Firmware Upgrade Cable to connect its Firmware Upgrade Port to your computer (or connect via Ethernet). Agree to the License Agreement; Then Click Next.
LICENSE AGREEMENT
LICENSE GRANT
ATEN International Co., Ltd. ("Licensor") grants to you a non-exclusive, non-transferable license to access and use FIRMWARE UPGRADE UTILITY (the "Product") during the "Term" set forth below. You may install the Product on a hard disk or other storage device; install and use the Product on a file server for use on a network for the purposes of (i) permanent installation onto hard disks or other storage devices or (ii) use of the Product over such network; and make backup copies of the Product.
RESTRICTIONS
You agree not to modify, adapt, translate, reverse engineer, recompile, disassemble or otherwise attempt to discover the source code of the Product, or create derivative works based on the Product, or remove any proprietary notices or labels on the Product, including copyright, trademark or patent pending notices. You may not sublicense the Product or otherwise allow others to use the Product licensed to you.
I Agree
I Don't Agree
Help
About
< Back
Next >
Cancel

**Screen Shot 1 – Firmware Upgrade Utility License Agreement**

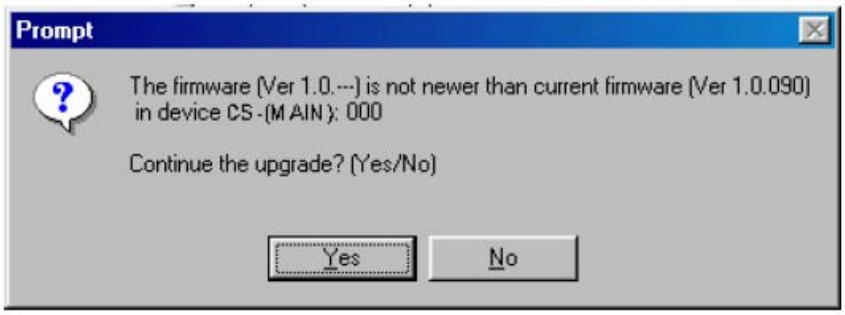
3. Click **[NEXT]**. The Firmware Upgrade Utility main screen appears. The Utility inspects your installation. All the devices capable of being upgrade by the package are listed in the *Device List* panel. The 4-port KVM may be listed as CS84U.


Firmware Upgrade Utility
If Check Firmware Version is checked, the utility compares the device's firmware level with the upgrade files. If the device's version is newer, the utility lets you decide whether to continue or not. If it is not checked, the utility performs the upgrade directly.
Click Next to begin.
Device List:
CS-(MAIN)
Status Messges:
> Loading & testing files ...
> Loading & testing files: OK
> Searching for devices ...
Device Description
Check Firmware Version
Progress...
Help
View Log
< Back
Next >
Cancel

**Screen Shot 2 – Firmware Upgrade Utility Main Screen**

4. As you select a device in the list, its description appears in the Device Description panel. After you have made your device selection, click **[NEXT]** to perform the upgrade.

   If you enabled Check Firmware Version, the Utility compares the device's firmware level with that of the upgrade files. If the device's version is higher than the upgrade version, a dialog box gives you the option to [***Continue]*** or [***Cancel]***.

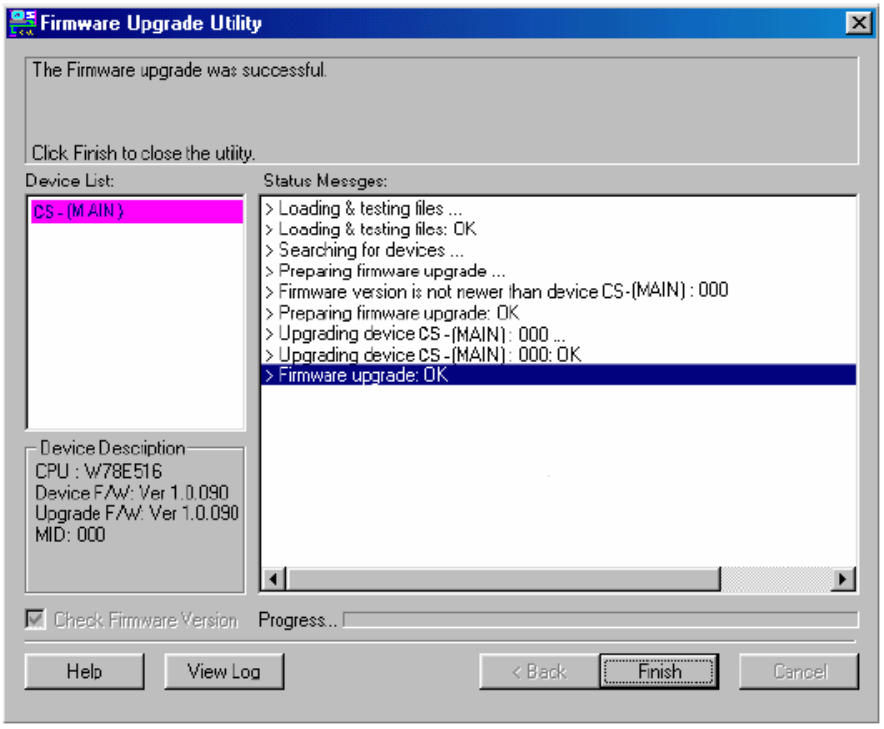

Prompt
The firmware (Ver 1.0.---) is not newer than current firmware (Ver 1.0.090) in device CS-(MAIN): 000
Continue the upgrade? (Yes/No)
Yes
No

**Screen Shot 3 – Firmware Upgrade Utility Prompt**

If you didn't enable Check Firmware Version, the Utility installs the upgrade files without checking whether they are a higher level or now.

## Upgrade Successful

After the upgrade has completed, a screen appears to inform you that the procedure was successful.


Firmware Upgrade Utility
The Firmware upgrade was successful.
Click Finish to close the utility.
Device List:
CS - (MAIN)
Status Messages:
> Loading & testing files ...
> Loading & testing files: OK
> Searching for devices ...
> Preparing firmware upgrade ...
> Firmware version is not newer than device CS-(MAIN) : 000
> Preparing firmware upgrade: OK
> Upgrading device CS - (MAIN) : 000 ...
> Upgrading device CS - (MAIN) : 000: OK
> Firmware upgrade: OK
Device Description
CPU : W78E516
Device F/W: Ver 1.0.090
Upgrade F/W: Ver 1.0.090
MID: 000
Check Firmware Version
Progress...
Help
View Log
< Back
Finish
Cancel

**Screen Shot 4 – Firmware Upgrade Utility Successful**

Click **[FINISH]** to close the Firmware Upgrade Utility.

After a successful firmware upgrade completion, the KVM exits Firmware Upgrade Mode and resets itself.

## Upgrade Failed

If the ***Upgrade Successful*** screen doesn't appear, it means that the upgrade failed to complete successfully, in which case you should contact Chassis Plans Customer Service for a resolution.

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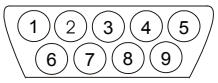
# Appendix A – Display Serial Control Programming

The LCD provides for remote serial RS232 control for the LCD through the rear panel Control Port as shown below.

## *RS-232 Serial control*

**Baud rate 2400, 8 bits, 1 stop bit and no parity**




Mating face of
RS-232 DB9 Male

| PIN# | Description |
|---|---|
| 2 | RS-232 Rx Data |
| 3 | RS-232 Tx Data |
| 5 | Ground |

**Mating connector : DB9 Female**

## *LCD Controller Serial Control Functions*

The OSD functions are controlled through the following RS-232 commands.

The RS-232 program can be custom-tailored to fit the application or it can be used as provided by Chassis Plans on request. Please contact Chassis Plans for additional information.

| Function | Command | Description | Acknowledge (if enabled) |
|---|---|---|---|
| OSD Menu Lock | 0xf6 | OSD menu Lock Off / OSD menu Lock On | Button equivalent |
| Menu | 0xf7 | Menu button pressed | Button equivalent |
| Select-down button | 0xfa | Select down button pressed | Button equivalent |
| Select-up button | 0xfb | Select up button pressed | Button equivalent |
| Right/+ button | 0xfc | Right/+button pressed | Button equivalent |
| Left/- button | 0xfd | Left/- button pressed | Button equivalent |

**Table 20 - Commands to Implement Switch Mount Control Buttons**

| Function | Command | Description | Acknowledge (if enabled) |
|---|---|---|---|
| Brightness control | 0x81,<br>nn \| "+" \| "-" \|<br>"r" \| "R" \|<br>"?" | Set brightness =<br>value/increment/decrement<br>Reset<br>Query | Brightness.<br><br>Range: "0""0"-"F""F"<br>Default: "8""0" |
| Contrast control | 0x82, "a" \| "A",<br>nn \| "+" \| "-" \|<br>"r" \| "R" \|<br>"?" | Set all contrast =<br>value/increment/decrement<br>Reset<br>Query | Contrast.<br><br>Range: "4""0"-"F""F"<br>Default: "8""0" |
| Phase # | 0x85,<br>nn \| "+" \| "-" \|<br>"?" | Set dot clock phase =<br>value/increment/decrement<br>Query | Dot clock phase.<br>(In ARGB mode only) |
| Image H position # | 0x86,<br>nnnn \| "+" \| "-" \|<br>"?" | Set img_hpos =<br>value/increment/decrement<br>Query | Image horizontal position.<br>(In ARGB mode only) |
| Image V position # | 0x87,<br>nnnn \| "+" \| "-" \|<br>"?" | Set img_vpos =<br>value/increment/decrement<br>Query | Image vertical position.<br>(In ARGB mode only) |
| Frequency # | 0x8b,<br>nnnn \| "+" \| "-" \|<br>"?" | Set H active size =<br>value/increment/decrement<br>Query | Frequency adjustment<br>(In ARGB mode only) |
| Input main select<br><br>* Function in valid mode only | 0x98,<br>nn \| "+" \| "-" \| "r" \|<br>"R" \| "?" | Select input main =<br>PC or video or next available<br>Reset<br>Query | Main selected.<br>"0x41,0x31" ARGB (Default)<br>"0x46,0x31" DVI |
| Colour temperature select | 0xb3,<br>n \|<br>"r" \| "R" \|<br>"?" | Select colour temperature =<br>value<br>Reset<br>Query | Main selected.<br>"0" – user defined RGB values.<br>"1" – 4200K.<br>"2" – 5000K.<br>"3" – 6500K.<br>"4" – 7500K. (Default)<br>"5" – 9300K. |
| Red level for selected colour temperature | 0xb4,<br><br>nn \| "+" \| "-" \|<br>"r" \| "R" \|<br>"?" | Set the level of the red channel for the selected colour temp. =<br>value/increment/decrement<br>Reset<br>Query | Red level for selected colour temperature.<br><br>Range: "8""0"-"F""F"<br>Default: "F""F" |
| Green level for selected colour temperature | 0xb5,<br><br>nn \| "+" \| "-" \|<br>"r" \| "R" \|<br>"?" | Set the level of the green channel for the selected colour temp. =<br>value/increment/decrement<br>Reset<br>Query | Green level for selected colour temperature.<br><br>Range: "8""0"-"F""F"<br>Default: "F""F" |
| Blue level for selected colour temperature | 0xb6,<br><br>nn \| "+" \| "-" \|<br>"r" \| "R" \|<br>"?" | Set the level of the blue channel for the selected colour temp. =<br>value/increment/decrement<br>Reset<br>Query | Blue level for selected colour temperature.<br><br>Range: "8""0"-"F""F"<br>Default: "F""F" |
| OSD turn off | 0xbd | Turn off the OSD | "1" - successful |
| Backlight brightness control | 0xe0,<br>nn \| "+" \| "-" \|<br>"r" \| "R" \|<br>"?" | Set backlight brightness =<br>value/increment/decrement<br>Reset<br>Query | Backlight brightness.<br><br>Range: "0""0"-"F""F"<br>Default: "F""F" |

| | | | |
|---|---|---|---|
| | | | e.g “1””0” → 0xe0 0x31 0x30<br>* This control can only function when JP2 sets 3-4 closed<br><br>* Apply for inverter control voltage in range of 0~5V.<br><br>Each step interval is in 1 |
| Backlight on/off control | 0xe1,<br>“0” \|<br>“1” \|<br>“r” \| “R” \|<br>“?” | Set backlight brightness =<br>Disable backlight<br>Enable backlight<br>Reset<br>Query<br>Backlight working status | Backlight on/off.<br><br>“1” = normal (Default) |
| OSD menu Lock (Functon available in V1.80.00 or later revision) | 0xf6,<br>n \| “0” \| “1” \|<br>“r” \| “R” \|<br>“?” | OSD menu Lock Off/ On<br>Reset<br>Query | “0” – OSD Lock Off<br>“1” – OSD Lock On |

**Table 21 - Parameter Setting - Immediate, Relative, Reset and Query**

# - Function in ARGB mode only

| Function | Command | Description | Acknowledge (if enabled) |
|---|---|---|---|
| Select RS-232 acknowledge | 0xc1, “0” \| “1” | Disable/enable command acknowledge. | “0” – acknowledge disabled.<br>“1” – acknowledge enabled. |
| Auto-setup# | 0xc3 | Start auto-setup of current mode. | “0” – fail.<br>“1” – successful. |
| Command availability | 0xc4, n | Check whether a command is available. | “0” – not available.<br>“1” – available. |
| Auto-calibration# | 0xc5 | Start auto-calibration of gain of the RGB amplifier. | “0” – fail.<br>“1” – successful. |
| Query BIOS version | 0xcb, “0” | Read BIOS version | “nnnn” = BIOS ver. “nn.nn” |
| Query PCBA number | 0xcb, “1” | Read PCBA number | “nnnn” = PCBA number<br>ALR-1400=”41710” |
| Load factory defaults | 0xce | Reset all parameters to factory default value | “1” – successful. |

**Table 22 - Other Control**

| Hex | ASCII | Hex | ASCII | Hex | ASCII | Hex | ASCII |
|---|---|---|---|---|---|---|---|
| 0x30 | 0 | 0x41 | A | 0x61 | a | 0x2B | + |
| 0x31 | 1 | 0x42 | B | 0x62 | b | 0x2D | - |
| 0x32 | 2 | 0x43 | C | 0x63 | c | 0x3F | ? |
| 0x33 | 3 | 0x44 | D | 0x64 | d | | |
| 0x34 | 4 | 0x45 | E | 0x65 | e | | |
| 0x35 | 5 | 0x46 | F | 0x66 | f | | |
| 0x36 | 6 | 0x47 | G | 0x67 | g | | |
| 0x37 | 7 | 0x48 | H | 0x68 | h | | |
| 0x38 | 8 | 0x49 | I | 0x69 | i | | |
| 0x39 | 9 | 0x4A | J | 0x6A | j | | |
| | | 0x4B | K | 0x6B | k | | |
| | | 0x4C | L | 0x6C | l | | |
| | | 0x4D | M | 0x6D | m | | |
| | | 0x4E | N | 0x6E | n | | |
| | | 0x4F | O | 0x6F | o | | |
| | | 0x50 | P | 0x70 | p | | |
| | | 0x51 | Q | 0x71 | q | | |
| | | 0x52 | R | 0x72 | r | | |
| | | 0x53 | S | 0x73 | s | | |
| | | 0x54 | T | 0x74 | t | | |
| | | 0x55 | U | 0x75 | u | | |
| | | 0x56 | V | 0x76 | v | | |
| | | 0x57 | W | 0x77 | w | | |
| | | 0x58 | X | 0x78 | x | | |
| | | 0x59 | Y | 0x79 | y | | |
| | | 0x5A | Z | 0x7A | z | | |

**Table 23 - Hex to ASCII Conversion Table**

# Appendix B – Auto Color Gain

The Auto Color Gain function is supported in the ARGB mode only and is designed to calibrate the controller to the incoming video signal. In order to calibrate correctly, the display must be displaying an image containing both black and white data (see illustration below) when the function is used. The internal processor of the video controller chip will then execute a process to adjust the relative values of the RGB signals to achieve the best performance. The parameters of the corrected RGB values are then stored in the controller and are unaffected by the Reset Factory Defaults function.

**Image B-1 – Auto Color Gain Example**

**Warning** - If the Auto Color Gain is executed without an appropriate image being displayed, then the process will set incorrect values and the display colors will be distorted. If this occurs, then it can either be corrected by performing the process correctly or if this is not possible then the Reset Color Gain function can be used. This function will reset the stored RGB values to a set of approximate values.

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# Appendix C - Troubleshooting the KVM

Operation problems can be due to a variety of causes. The first step in solving them is to make sure that all cables are securely attached and seated completely in their sockets. In addition, updating the product's firmware may solve problems that have been discovered and resolved since the prior version was released.

| Symptom | Possible Cause | Action |
|---|---|---|
| **Erratic Behavior** | Unit not receiving sufficient power | Use a DC 5V power adapter if you are not already using one. If you are already using a power adapter, check that it matches the system specifications and that it is plugged in and functioning properly |
| | Keyboard and/or mouse need to be reset. | Unplug the cable(s) from the console ports and then plug them back in. |
| | No connection to the computer. | Check the cable from the switch to the computer to make sure it is properly connected. |
| | KVM switch needs to be reset. | Power off all devices on the installation, power off the KVM switch, wait 10 seconds, then power up. |
| **USB Devices Not Responding** | USB ports need to be reset. | Unplug the device's USB cable from the USB port on the switch's rear panel, then plug it back in. |
| | | Use the USB Reset hotkey combination to reset the USB ports. |
| **Cannot switch ports by pressing [SCROLL LOCK] twice** | Keyboard is incompatible with SCROLL LOCK invocation | Switch to the Alternate HSM invocation keys. See *Alternate HSM Invocation Keys* for details. |
| **Monitor does not display after KVM cable set is hot plugged** | Some graphics cards are incompatible with cable set hot plugging. | Power off all devices on the installation, power off the switch, confirm all KVM cables are properly connected, power on the switch, power on the computers. |
| **When switching ports, the monitor does not display.** | Monitor is new or this is the first time installation. | Switch ports again and wait two or more seconds for the PC's EDID to pass to the monitor. |
| | The PC's EDID has not passed through to the monitor when switching ports. | Use the **[D]** hotkey to invoke Video DynaSync one more time or switch to another PC to reconnect the switch. See HSM Summary Table. |

**Table 24 – Troubleshooting the KVM**

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# Appendix D – DVI-D versus DVI-I Connectors

The Digital Visual Interface (DVI) is a video interface standard designed to provide very high visual quality on digital display devices such as flat panel LCD computer displays and digital projectors. It was developed by an industry consortium, the Digital Display Working Group (DDWG). It is designed for carrying uncompressed digital video data to a display. It is partially compatible with the High-Definition Multimedia Interface (HDMI) standard in digital mode (DVI-D), and VGA in analog mode (DVI-A).

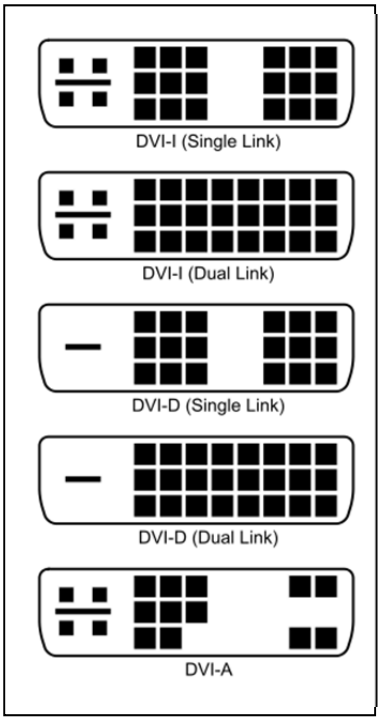
The LCD controllers offered with the CCX keyboards offer DVI-D and DVI-I, depending on which controller is selected. This discussion is presented to help clarify the difference between the various flavors of DVI.

## *Overview*

The DVI interface uses a digital protocol in which the desired illumination of pixels is transmitted as binary data. When the display is driven at its native resolution, it will read each number and apply that brightness to the appropriate pixel. In this way, each pixel in the output buffer of the source device corresponds directly to one pixel in the display device, whereas with an analog signal the appearance of each pixel may be affected by its adjacent pixels as well as by electrical noise and other forms of analog distortion.

## *Connectors*

The DVI connector usually contains pins to pass the DVI-native digital video signals. In the case of dual-link systems, additional pins are provided for the second set of data signals.




As well as digital signals, the DVI connector includes pins providing the same analog signals found on a VGA connector, allowing a VGA monitor to be connected with a simple plug adapter. This feature was included in order to make DVI universal, as it allows either type of monitor (analog or digital) to be operated from the same connector.

The DVI connector on a device is therefore given one of four names, depending on which signals it implements:

**DVI-D (digital only)**
**DVI-I (integrated, digital & analog)**

The connector also includes provision for a second data link for high resolution displays, though many devices do not implement this. In those that do, the connector is sometimes referred to as DVI-DL (dual link).

The long flat pin on a DVI-I connector is wider than the same pin on a DVI-D connector, so it is not possible to connect a male DVI-I to a female DVI-D by removing the 4 analog pins. It is possible, however, to connect a male DVI-D cable to a female DVI-I connector. Many flat panel LCD monitors have only the DVI-D connection so that a DVI-D male to DVI-D male cable will suffice when connecting the monitor to a computer's DVI-I female connector.

Essentially, DVI-D is the same as DVI-I with DVI-D missing the analog portion of the signals. A DVI-D connector and monitor can connect to a DVI-I output and function. A DVI-I monitor can connect to a DVI-D output with the caveat that no analog video will be available.

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